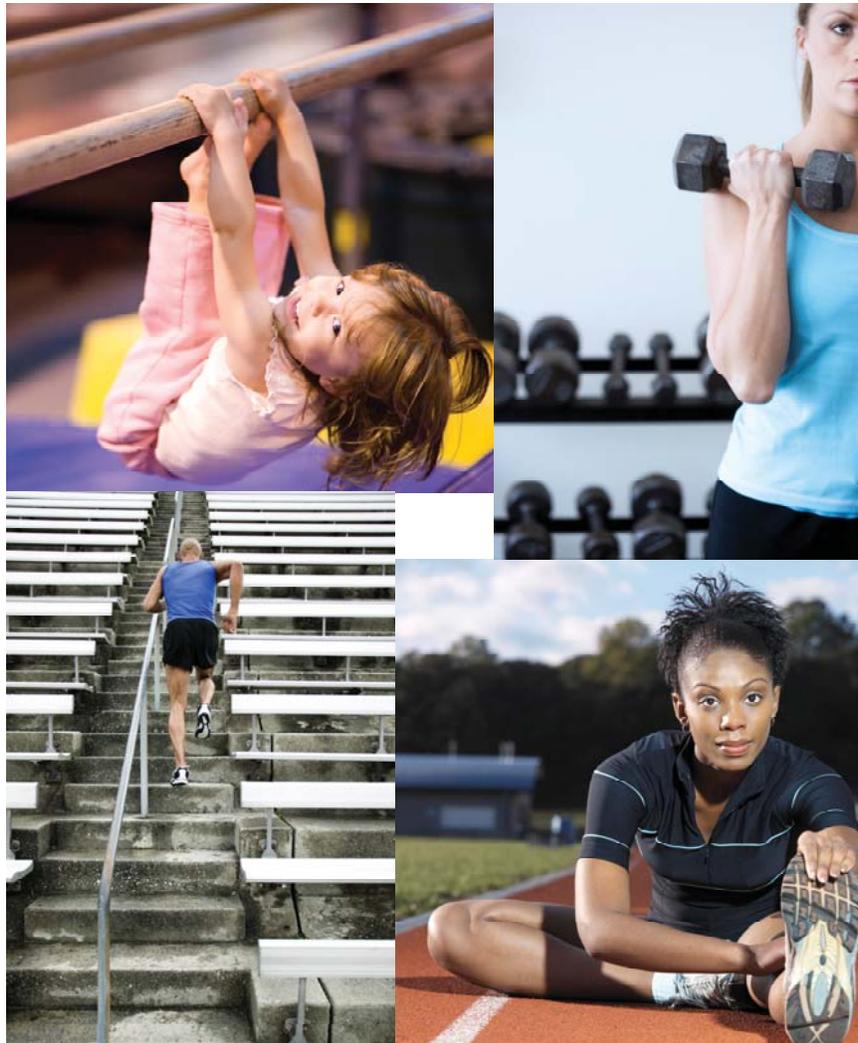


# Overweight and Obesity in Michigan: Surveillance Report Series



## Physical Activity Chapter 2009

Michigan Department  
of Community Health



Jennifer M. Granholm, Governor  
Janet Olszewski, Director

Michigan's CDC funded Nutrition, Physical Activity and Obesity Program is in the process of developing the "Overweight and Obesity in Michigan" surveillance report. The report will contain four chapters, Physical Activity, Nutrition, Breastfeeding and Obesity. Each chapter will be released individually with the final report completed and released by the summer of 2009.

The first released chapter, Physical Activity, contains surveillance data on Physical Inactivity, Inadequate Physical Activity, Television Viewing (Youth) and Computer/Video Game Use (Youth).

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**Introduction:**

Regular physical activity is one of the most important contributors to health and a key factor in maintaining a healthy weight. Regular physical activity decreases the risk of developing other chronic diseases including colon cancer and osteoporosis. Physical activity helps to achieve and maintain a healthy weight while contributing to the health of bones, joints, and muscles. It can also reduce feelings of anxiety and depression.<sup>1</sup>

Physical inactivity is one of the six modifiable risk factors for heart disease and stroke identified by the American Heart Association (AHA) and is strongly correlated with increasing cardiovascular risk factors such as obesity, high blood pressure, high triglycerides, high cholesterol and diabetes.<sup>1</sup>

Even though the benefits of physical activity are apparent, less than half of adults in the United States engage in physical activity regularly.<sup>2</sup> The estimated cost of physical inactivity in 2000 was \$76.6 billion in the United States.<sup>3</sup> In 2002, the direct and indirect costs were \$8.9 billion in Michigan alone.<sup>4</sup>

*Healthy People 2010* aims to reduce the proportion of adults who engage in no leisure-time physical activity to 20%. As of 2005, 40% of adults in the United States were still not getting any physical activity.<sup>5</sup>

**Key Findings:***Adults*

- In 2008, 49.4% of Michigan adults did not get the recommended amount of physical activity (i.e. Moderate physical activity for a total of at least 30 minutes on five or more days a week or vigorous activity for a total of at least 20 minutes on three or more days per week while not at work).
- Physical inactivity increases with age and decreases with education and income.
- In 2008, obese Michigan adults had a significantly higher prevalence of inadequate physical activity and no leisure-time physical activity compared with adults who were not obese.

*Youth*

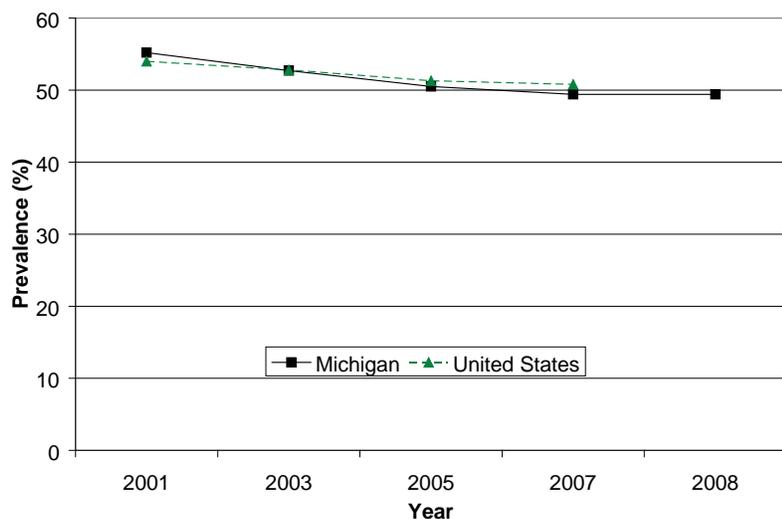
- As of 2005, Michigan youth had not yet reached the *Healthy People 2010* targets for vigorous or moderate physical activity (i.e. Moderate physical activity for a total of at least 30 minutes on five or more days a week or vigorous activity for a total of at least 20 minutes on three or more days per week while not at work).
- Female youth (64.5%) were more likely to not meet the 2008 physical activity guidelines than males (47.3%).
- Black youth had the highest prevalence of excessive television viewing (58.1%) and computer or video game use (30.7%) in 2007.

**Adults**

The United States Department of Health and Human Services (DHHS) 2008 Physical Activity Guidelines for Americans recommend that adults engage in at least 150 minutes of moderate-intensity physical activity, above usual activity at work or home, or 75 minutes of vigorous physical activity a week to reduce the risk of chronic disease. Activity should be performed in at least 10 minute intervals throughout the week. Adults should also do muscle-strengthening activities on two or more days a week.<sup>6</sup>

Despite the release of new recommendations data are collected by previous guidelines which recommend moderate physical activity for a total of at least 30 minutes on five or more days a week or vigorous activity for a total of at least 20 minutes on three or more days per week while not at work.<sup>7</sup> Therefore the following results should be read and interpreted accordingly.

Figure 1. Prevalence of inadequate physical activity\* among adults, 18 and over, in Michigan and United States, 2001 to 2008.

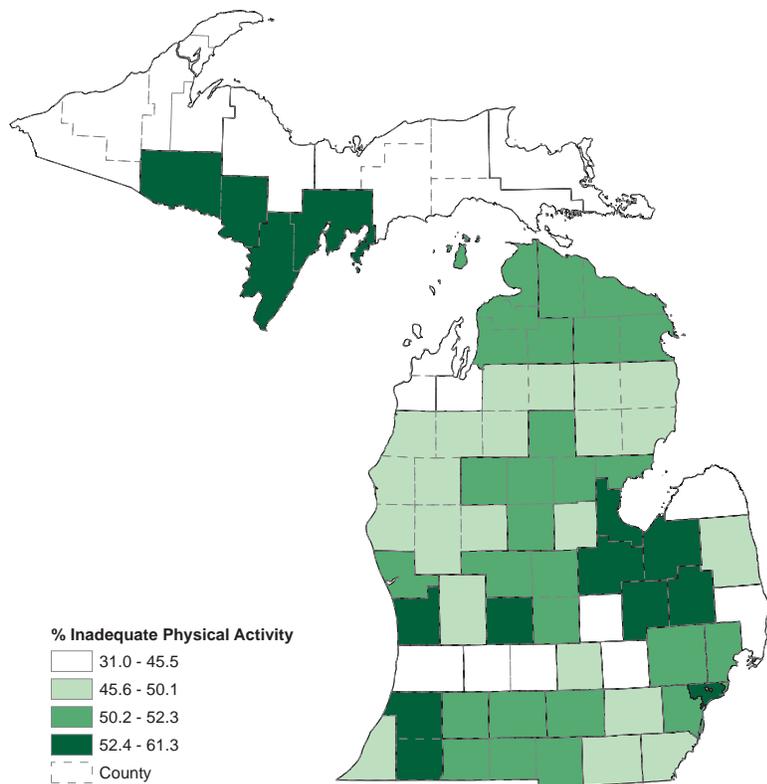


Source: Michigan Behavioral Risk Factor Survey (BRFS) and CDC Behavioral Risk Factor Surveillance System.

\*The proportion who reported that they do not usually do moderate physical activities for a total of at least 30 minutes on five or more days a week or vigorous activities for a total of at least 20 minutes on three or more days per week while not at work (This question was not included in the national BRFS in 2008).

- In 2008, the prevalence of inadequate physical activity among Michigan adults was 49.4%. This represents a decrease of 5.8% since 2001.
- Inadequate physical activity increases with age from 40.8% among adults aged 18 to 24 years to 64.0% among adults 75 years and older.
- Prevalence also decreases with income: 56.9% of adults with a household income less than \$20,000 had inadequate physical activity compared to 44.2% of adults with a household income of more than \$75,000.

Map 1. Prevalence of inadequate physical activity\* among adults, 18 and over in Michigan by local health department jurisdictions, 2005 to 2007.



Source: Michigan Behavioral Risk Factor Survey (BRFS)

\*The proportion who reported that they do not usually do moderate physical activities for a total of at least 30 minutes on five or more days a week or vigorous activities for a total of at least 20 minutes on three or more days per week while not at work.

- The prevalence of inadequate physical activity in Michigan from 2005 to 2007 was 50.1%.
- More than half of adults in 23 local health department areas were not meeting the physical activity recommendations.
- Van Buren-Cass Local Health Department had the highest prevalence of inadequate physical activity (61.3%) and Luce-Mackinac-Alger-Schoolcraft Local Health Department had the lowest or best (31.0%).
- See Appendix B for a list of all the health department areas and their corresponding prevalences.

Figure 2. Prevalence of no leisure-time physical activity\* among adults, 18 and over in Michigan, 2001 and 2008.

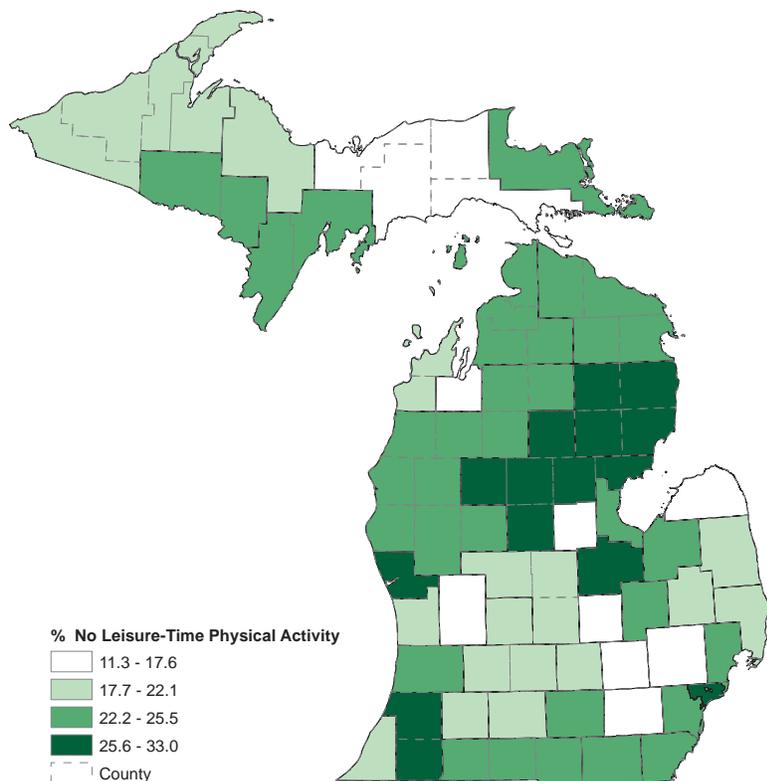
Measure	Prevalence (%) Michigan 2001	Prevalence (%) Michigan 2008
Total	23.5	25.1
Gender		
Male	20.5	22.5
Female	26.2	27.5
Race		
White	22.5	23.6
Black	29.9	30.3

Source: Michigan Behavioral Risk Factor Survey (BRFS)

\*The proportion who reported not participating in any leisure-time physical activities or exercises, such as running, calisthenics, golf, gardening, or walking, during the past month.

- In 2008, the prevalence of no leisure-time physical activity was 25.1%. This has remained steady over the past few years.
- No leisure-time physical activity increases with age from 18.1% among adults aged 18-24 to 40.1% among adults 75 years and above but decreases with education and household income.
- In Michigan, females (27.5%) had a higher prevalence of no leisure-time physical activity compared with males (22.5%).

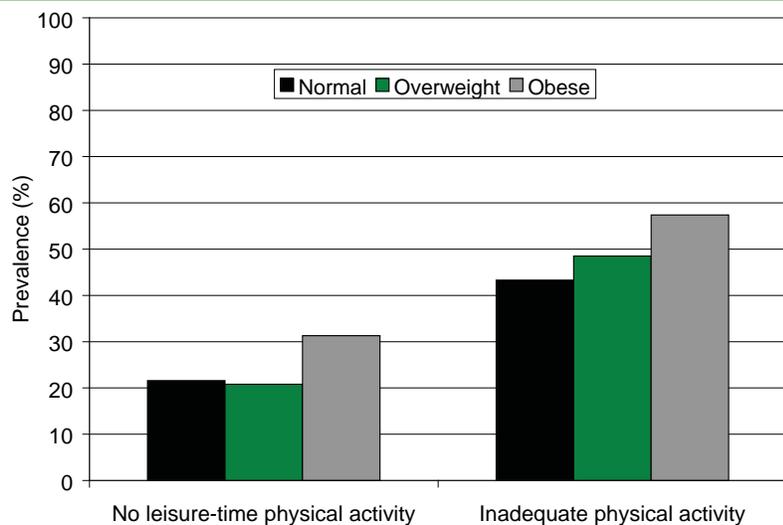
Map 2. Prevalence of no leisure-time physical activity\* among adults, 18 and over in Michigan by local health department jurisdictions, 2005 to 2007.



Source: Michigan Behavioral Risk Factor Survey (BRFS)  
 \*The proportion who reported not participating in any leisure-time physical activities or exercises, such as running, calisthenics, golf, gardening, or walking, during the past month.

- The prevalence of no leisure-time physical activity in Michigan from 2005 to 2007 was 22.1%.
- The City of Detroit had the highest prevalence, 33.0% of no leisure-time physical activity and Grand Traverse County had the lowest, 11.3%.
- Out of Michigan’s 45 local health departments, only 15 have met the *Healthy People 2010* target set at 20%.
- See Appendix B for a list of all the health department areas and their corresponding prevalences.

Figure 3. Prevalence of no leisure-time physical activity or inadequate physical activity among adults, 18 and over by weight status in Michigan, 2008.



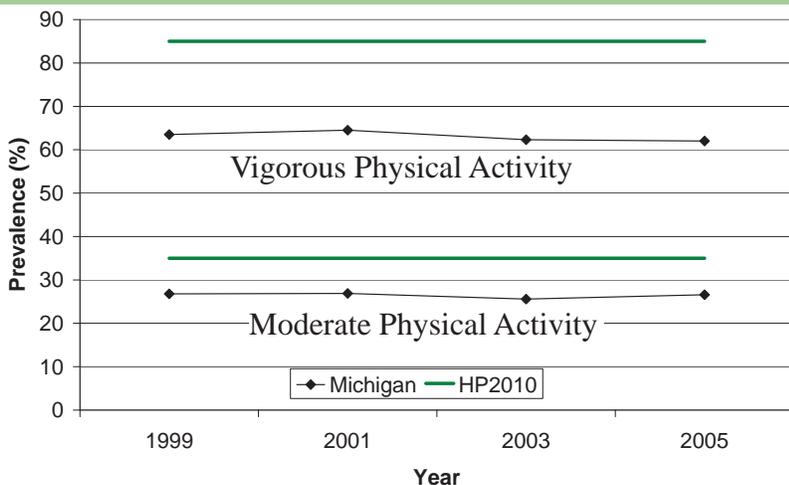
Source: Michigan Behavioral Risk Factor Survey (BRFS)

- In 2008, Michigan adults who were obese reported significantly more inadequate physical activity and no leisure-time physical activity compared with adults that reported a BMI that was normal or overweight.
- Prevalence of inadequate and no leisure-time physical activity increases as BMI increases.
- Women reported a higher prevalence of inadequate and no leisure-time physical activity than males within each BMI range. However, the differences were not significant.

**Youth**

Before the 2008 Physical Activity Guidelines for Americans were published, it was recommended that youth participate in moderate physical activity at least 30 minutes a day on five or more days per week or participate in vigorous activity for at least 20 minutes on three or more days per week.<sup>6</sup>

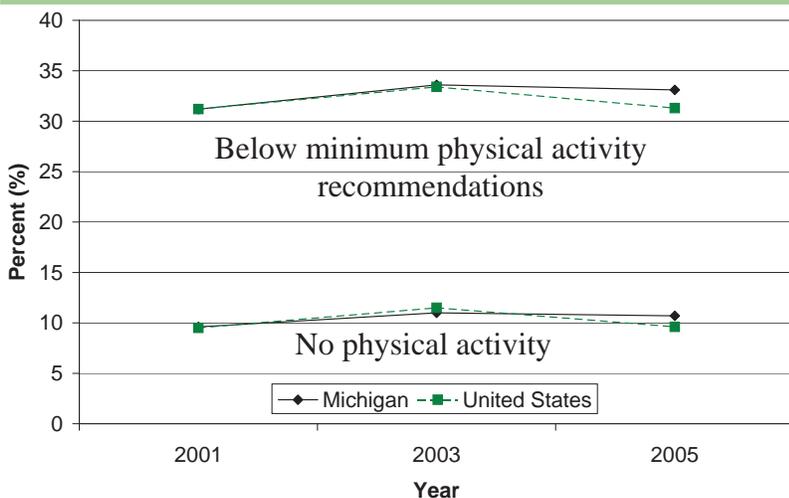
Figure 4. Prevalence of physical activity among youth, grades 9 through 12, in Michigan compared to the *Healthy People 2010* targets, 1999 to 2005.



Sources: Michigan Youth Risk Behavior Survey and *Healthy People 2010*.

- The *Healthy People 2010* target for vigorous physical activity among youth was set for 85.0%. Michigan youth had not reached this target in 2005, with a prevalence of 62.0%.
- The *Healthy People 2010* target for moderate physical activity was set for 35.0%. Michigan youth were also still below this target with a prevalence of 26.6% in 2005.

Figure 5. Prevalence of physically inactivity\* among youth, grades 9 through 12, in Michigan and United States, 2001 to 2005.



Sources: Michigan Youth Risk Behavior Survey and CDC Youth Risk Behavior Surveillance System.

\*The proportion who reported that they do not usually do moderate physical activity for a total of at least 30 minutes on five or more days a week or vigorous activities for a total of at least 20 minutes on three or more days per week.

- In 2005, 33.1% of Michigan youth did not meet the recommended amount of physical activity.
- More females (36.8%) than males (29.3%) did not meet the recommended amount of physical activity.
- In 2005, 10.7% of Michigan youth reported no physical activity in the last seven days.

The DHHS 2008 Physical Activity Guidelines for Americans recommend that children and adolescents ages 6 to 17 years do at least 60 minutes of physical activity each day. Most of this time should be spent doing either moderate-intensity (such as bicycle riding or brisk walking) or vigorous-intensity (such as running, jumping rope, or dancing) physical activity in intervals of 10 minutes or more. Vigorous-intensity activity should be done on at least three days per week. Muscle-strengthening activity (such as playing on playground equipment, climbing trees, and playing tug-of-war) and bone-strengthening activity (such as basketball or hopscotch) should also be done on at least three days per week. Physical activity should be enjoyable, varied, and appropriate for the child or adolescents age.<sup>6</sup>

Figure 6. Prevalence of not achieving 60 minutes of physical activity five or more days in the past week, among youth grades 9 through 12 in Michigan and United States, 2007.

Measure	Prevalence (%) Michigan	Prevalence (%) U.S.
Total	56.0	65.3
Gender		
Male	47.3	56.3
Female	64.5	74.4
Race/Ethnicity		
Black	59.0	68.9
White	54.2	63.0
Hispanic	60.9	69.8

Sources: Michigan Youth Risk Behavior Survey and CDC Youth Risk Behavior Surveillance System.

- The proportion of youth who did not achieve the recommended weekly physical activity is higher in the United States (65.3%) than in Michigan (56.0%).
- Females (64.5%) were more likely to get inadequate physical activity than males (47.3%).
- Almost 30% of students reported currently being enrolled in a daily physical education class, of these, 44.5% reported exercising or playing sports for more than 20 minutes per class.

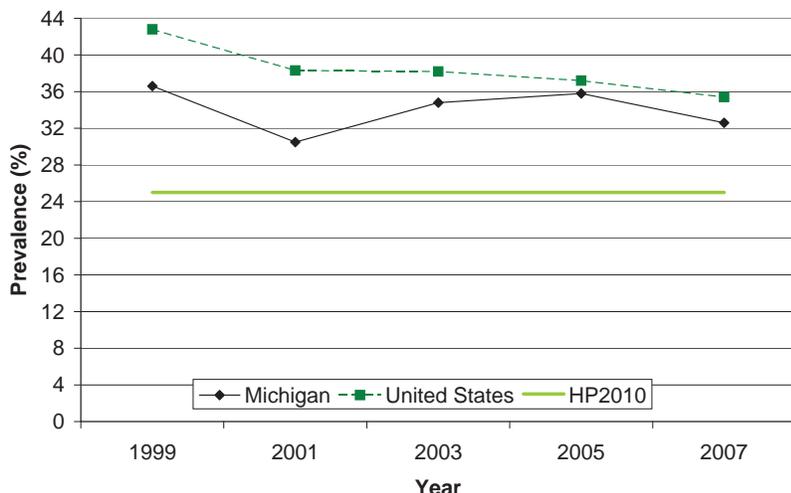
### Television Viewing

Television (TV) viewing creates an additional barrier to physical activity. TV viewing is associated with reduced resting metabolic rate, displaced physical activity, excess energy intake through snacking, and exposure to the marketing of high energy-dense foods through commercials.

Research has shown that children and adults who watch a greater number of hours of television are more likely to be overweight or obese. In addition, children who watch more television are more likely to become obese when they are adults. The American Academy of Pediatrics recommends that children under two years of age not watch any TV and that children two years old and above watch no more than one to two hours of TV per day.

Decreasing TV viewing has been shown to have positive health effects. In a school-based intervention where children decreased their TV watching, their body mass index also decreased.<sup>8</sup>

Figure 7. Prevalence of excessive\* TV viewing among youth, grades 9 through 12, in Michigan and United States compared to *Healthy People 2010* target, 1999 to 2007.



Sources: Michigan Youth Risk Behavior Survey and CDC Youth Risk Behavior Surveillance System.

\*The proportion of youth that watched three or more hours of television a day on an average school day.

- In 2007, the prevalence of excessive TV viewing among youth in Michigan was 32.6%.
- This prevalence has decreased 10.9% since 1999 in Michigan and 17.3% in the United States.
- In 2007, prevalence of excessive TV viewing was significantly higher among blacks (58.1%) than whites (26.6%) and Hispanics (39.6%).
- National and Michigan rates remain above the *Healthy People 2010* target for television viewing.

Figure 8. Prevalence of excessive\* computer or video game use among youth, grades 9 through 12, in Michigan and United States, 2007.

Measure	Prevalence (%) Michigan	Prevalence (%) U.S.
Total	22.9	24.9
Gender		
Male	27.5	29.1
Female	18.0	20.6
Race/Ethnicity		
Black	30.7	30.5
White	21.3	22.6
Hispanic	24.8	26.3

Sources: Michigan Youth Risk Behavior Survey and CDC Youth Risk Behavior Surveillance System.

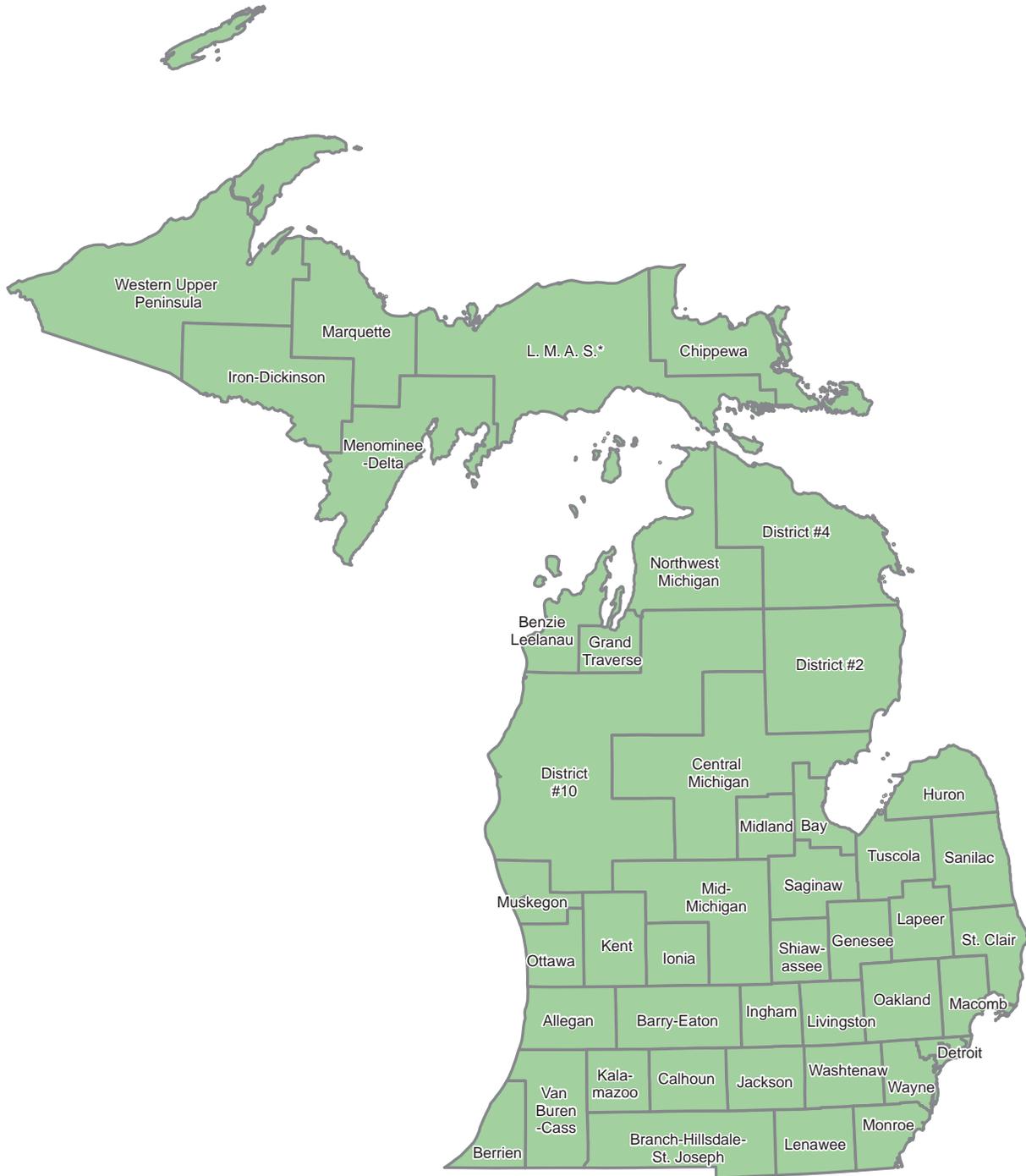
\*The proportion of youth who played video or computer games or used the computer for something that was not schoolwork three or more hours per day on an average school day.

- The prevalence of computer or video game use among youth is about the same in Michigan (22.9%) as in the United States (24.9%).
- In Michigan, males (27.5%) are significantly more likely to play large amounts of video or computer games than females (18.0%).
- Similar to television viewing, blacks (30.7%) have the highest prevalence of excessive video or computer game use, higher than whites (21.3%).

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**Appendix A:** The Local Health Department Jurisdictions in Michigan.



\* Luce-Mackinac-Alger-Schoolcraft

**Appendix B:** Physical inactivity prevalence rates for Michigan adults, 2005 to 2007.

<b>Local Health Department</b>	<b>Inadequate Physical Activity</b>	<b>No Leisure Time Physical Activity</b>
Allegan	42.8	23.2
Barry-Eaton	43.4	20.2
Bay	54.9	22.5
Benzie-Leelanau	35.6	21.9
Berrien	46.7	21.7
Branch-Hillsdale-St. Joseph	51.5	23.7
Calhoun	51.8	21.5
Central Michigan	51.0	26.5
Chippewa	45.5	24.5
City of Detroit	56.7	33.0
District #10	47.6	23.5
District #2	49.8	28.5
District #4	50.2	25.5
Genesee	53.2	25.5
Grand Traverse	41.9	11.3
Huron	41.3	13.9
Ingham	49.7	20.6
Ionia	54.0	19.9
Iron-Dickinson	55.8	24.1
Jackson	51.8	22.6
Kalamazoo	52.3	18.8
Kent	47.6	17.6
Lapeer	54.2	19.9
Lenawee	46.5	23.9
Livingston	42.8	14.5
Luce-Mackinac-Alger-Schoolcraft (LMAS)	31.0	17.5
Macomb	51.7	22.3
Marquette	44.4	20.7
Menominee-Delta	54.8	23.5
Midland	47.9	17.2
Mid-Michigan	51.0	22.1
Monroe	47.3	22.9
Muskegon	50.8	28.8
Northwest Michigan	51.7	25.2
Oakland	50.4	17.3
Ottawa	53.4	18.3
Saginaw	55.9	28.0
Sanilac	47.2	20.4
Shiawassee	34.1	15.5
St. Clair	45.3	19.9
Tuscola	53.4	24.0
Van Buren-Cass	61.3	27.0
Washtenaw	45.8	17.0
Wayne, excluding Detroit	50.4	23.7
Western Upper Peninsula	45.0	19.1

Source: Michigan Behavioral Risk Factor Survey (BRFS)

**Appendix C:** *Healthy People 2010* goals related to physical activity.

(Objective 22-1) Reduce the proportion of adults who engage in no leisure-time physical activity to 20%.
(Objective 22-2) Increase the proportion of adults who engage regularly, preferably daily, in moderate physical activity for at least 30 minutes per day to 30%.
(Objective 22-3) Increase the proportion of adults who engage in vigorous physical activity that promotes the development and maintenance of cardiorespiratory fitness 3 or more days per week for 20 minutes or more per occasion to 30%.
(Objective 22-4) Increase the proportion of adults who perform physical activities that enhance and maintain muscular strength and endurance to 30%.
(Objective 22-5) Increase the proportion of adults who perform physical activities that enhance and maintain flexibility to 43%.
(Objective 22-6) Increase the proportion of adolescents who engage in moderate physical activity for at least 30 minutes on 5 or more of the previous 7 days to 35%.
(Objective 22-7) Increase the proportion of adolescents who engage in vigorous physical activity that promotes cardiorespiratory fitness 3 or more days per week for 20 or more minutes per occasion to 85%.
(Objective 22-8) Increase the proportion of the Nation's public and private schools that require daily physical education for all students to 25% for middle and junior high schools and to 5% for senior high schools.
(Objective 22-9) Increase the proportion of adolescents who participate in daily school physical education to 50%.
(Objective 22-10) Increase the proportion of adolescents who spend at least 50 percent of school physical education class time being physically active to 50%.
(Objective 22-11) Increase the proportion of adolescents who view television 2 or fewer hours on a school day to 75%.
(Objective 22-12) (Developmental) Increase the proportion of the Nations' public and private schools that provide access to their physical activity spaces and facilities for all persons outside of normal school hours (that is, before and after the school day, on weekends, and during summer and other vacations).
(Objective 22-13) Increase the proportion of worksites offering employer-sponsored physical activity and fitness programs to 75%.
(Objective 22-14) Increase the proportion of trips made by walking to 25% for adults aged 18 years and older and to 50% for children and adolescents aged 5 to 15 years.
(Objective 22-15) Increase the proportion of trips made by bicycling to 2% for adults aged 18 years and older and to 5% for children and adolescents aged 5 to 15 years.

Source: *Healthy People 2010*, Chapter 22.

<http://www.healthypeople.gov/Document/HTML/Volume2/22Physical.htm>

**Appendix D:** List of abbreviations.

AHA.....	American Heart Association
BMI.....	Body Mass Index
BRFS.....	Behavioral Risk Factor Survey
CDC.....	Centers for Disease Control and Prevention
DHHS.....	Department of Health and Human Services
<i>HP 2010</i> .....	<i>Healthy People 2010</i>
L.M.A.S. ....	Luce-Mackinac-Alger-Schoolcraft
MDCH.....	Michigan Department of Community Health
TV.....	Television
YRBS.....	Youth Risk Behavior Survey

**Appendix E: Methods****Prevalence**

Prevalence is the proportion of individuals in a population who have the condition at a point in time or during a given time period. It is often used to describe the health burden on a given population. Prevalence is computed by dividing the number of existing cases at a particular point or period in time by the total population from which the cases came. It is often multiplied by 100 and expressed as a percent. In this report, prevalence estimates are generated in the analysis of data from the Behavioral Risk Factor Surveillance System and Youth Risk Behavior Survey.

$$\text{Prevalence} = \frac{\text{Number of existing cases of disease}}{\text{Total population}}$$

For example, 25.1% of adults in Michigan do not participate in leisure-time physical activity. This is the prevalence of no leisure-time physical activity. The number of survey respondents who reported no leisure-time physical activity was divided by the total number of respondents that were asked the question. This proportion is also weighted to adjusted for the survey design and nonresponse.

**Geographical Information System Mapping**

Environmental Systems Research Institute's (ESRI) ArcGIS Map was used to create the maps presented in the report. Data used in the maps were from the Behavioral Risk Factor Survey. Analyses of the data used in the maps were performed externally from the ArcGIS program.

**Appendix F:** Data Sources

**Name:** Michigan Behavioral Risk Factor Surveillance System

**Acronym:** BRFSS

**Basic Purpose and History:** The BRFSS is a source of estimates of the prevalence of certain health behaviors, conditions, and practices associated with leading causes of death. Michigan has conducted the BRFSS survey since 1987.

**Data Collection Process:** Annual estimates are based on data collected by telephone from a sample of Michigan adults selected using random-digit dial methods. It is a population-based representative sample of non-institutionalized Michigan residents. The data are weighted to represent estimates for the general adult population. BRFSS interviewers use a Computer Assisted Telephone Interviewing (CATI) system, which provides the interviewer with prompts. The interviewer types the respondent's responses directly into the computer, providing quality control and minimizing interviewer error.

**Population Included:** A record is a completed telephone interview. The selected respondent must be a Michigan resident, 18 years of age or older who lives in a private residence and has a telephone. One randomly selected adult from a household is interviewed.

**Additional Information:** For more information about the BRFSS and national data for comparison, visit <http://www.cdc.gov/brfss/index.htm>. For a complete report from the Michigan survey, visit <http://www.michigan.gov/brfs>.

**Name:** Youth Risk Behavior Survey

**Acronym:** YRBS

**Basic Purpose and History:** YRBS was designed to determine the prevalence of health-risk behaviors among high school students. It was also designed to monitor trends and progress toward achieving national health objectives. Michigan first administered the survey in 1997.

**Data Collection Process:** A two-stage cluster sampling method is implemented in which public schools with grades 9 through 12 are first selected, followed by classes within those schools. The questionnaire is self-administered by students. The survey is conducted every odd year at the national, state and local levels.

**Population Included:** Public and private school students in grades 9 through 12 are eligible to participate.

**Additional Information:** For more information about the YRBS and national data for comparison, visit <http://www.cdc.gov/HealthyYouth/yrbs/index.htm>.

**Appendix G:** References

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